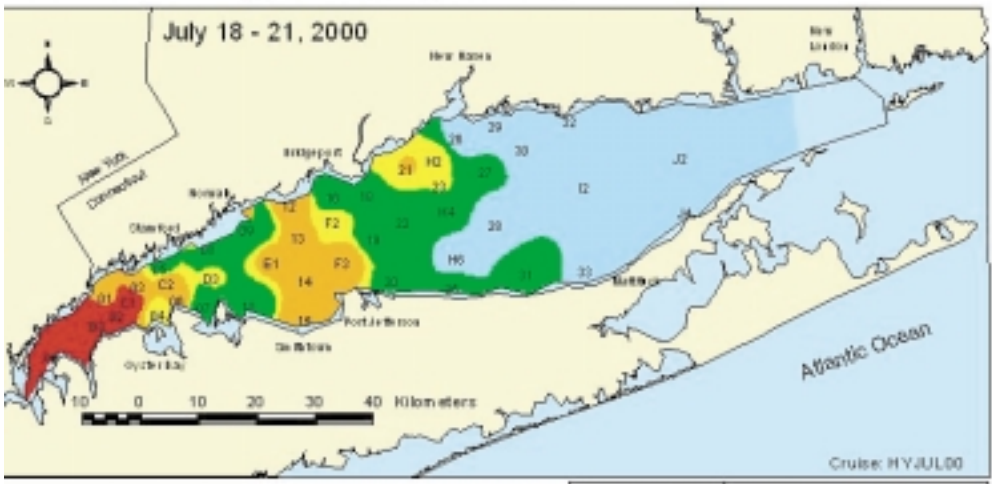
Are the Waters and Sediments Getting Cleaner?

HYPOXIA

Dissolved oxygen levels in water are often used to gauge the overall health of the aquatic environment. When dissolved oxygen levels in the bottom water layer of the Sound are low (a condition called hypoxia) to non-existent (anoxia), then the survival, reproduction, or use of an area by living marine resources is impaired. This can affect commercially-valuable marine species by depleting their food sources or impairing their development due to stress caused by inadequate oxygen concentrations.

From mid-July through September, Long Island Sound and many of its aquatic inhabitants suffer from hypoxia. During this period, oxygen levels in the bottom waters of Long Island Sound fall to levels inadequate to support healthy populations of aquatic life.

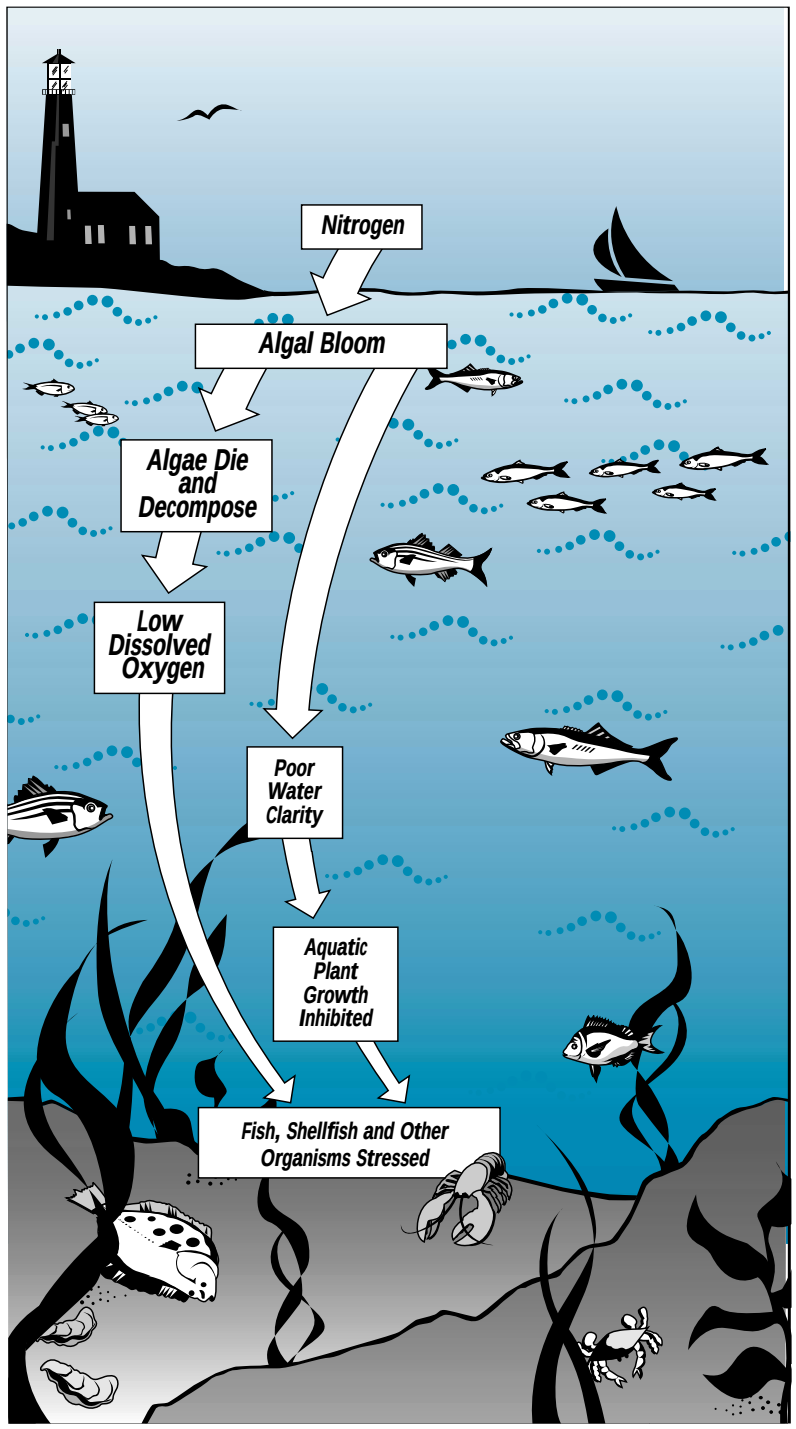
Dissolved Oxygen in Long Island Sound Bottom Waters



Dissolved oxygen levels in bottom waters in July 2000. The western portion of Long Island Sound exhibited hypoxic levels during this period. CT DEP, LIS Water Quality Monitoring Program

Hypoxia is a symptom of a larger problem, the over-fertilization of the Sound with nutrients, primarily nitrogen. While nitrogen is a necessary nutrient in a productive ecosystem - a building block for plant and animal tissue - too much nitrogen fuels the excessive growth of planktonic algae (floating plants). The dense algae blooms cloud the water and shade the bottom. When the algae die and settle to the bottom of the Sound, they are decayed by bacteria, a process that uses up available oxygen. Oxygen in short supply impairs the feeding, growth, and reproduction of the Sound's aquatic life. In extreme conditions, some organisms may suffocate and die, while others flee the hypoxic zones. The dense blooms also prevent enough light from reaching shallow water bottoms to support the growth of submerged aquatic vegetation, an important habitat for shellfish and juvenile fish. As a result, nitrogen - in excess - impairs the function and health of Long Island Sound.

Effects of Excess Nitrogen



Since 1990, the LISS has been implementing a phased plan to improve oxygen levels in the Sound by reducing nitrogen loads. In 1998, LISS adopted a 58.5 percent reduction target for nitrogen loads from human sources to the Sound over 15 years, with five and ten-year interim targets to assure steady progress. The states of Connecticut and New York are working to achieve the target through upgrades to sewage treatment plants, watershed restoration strategies to control nitrogen runoff, and reductions in nitrogen oxide emissions to the air. As a result, nitrogen discharges to Long Island Sound have decreased, reducing algae growth, and improving oxygen levels.